

# THE HAWAIIAN FORESTER AND AGRICULTURIST

FEBRUARY, 1917

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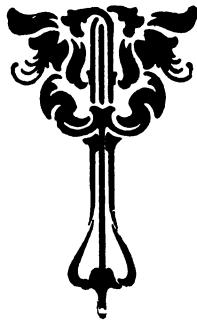
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# The Hawaiian Forester and Agriculturist

A Monthly Magazine of Forestry,  
Entomology, Animal Industry,  
Hydrography and Agriculture.

Issued under the direction of the Board  
of Commissioners of Agriculture  
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# Board of Agriculture and Forestry

## DIVISION OF FORESTRY.

### FOREST AND ORNAMENTAL TREE SEED AND SEEDLINGS FOR SALE AT THE GOVERNMENT NURSERY.

The Division of Forestry keeps constantly on hand at the Government Nursery, seed and seedlings of the important native and introduced trees. These are sold at prices just covering the cost of collection or growing.

The list includes both forest and ornamental trees, such as Silk Oak, Koa, various species of Eucalyptus, Golden and Pink Showers, Pride of India, Poinciana, Albizzia, etc. The price of the seed varies from 10 to 50 cents per ounce. The seedlings may be had for 2½ cents each, except a few kinds which are 5 cents. Seed of the various palms is also for sale, the price per 100 varying from \$1.00 to \$2.50. All seed is tested before being sent out, which insures its being good.

All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
Superintendent of Forestry.

## DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter, always write your name and address in the upper left-hand corner of the package. Address all communications, SUPERINTENDENT DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

EDW. M. EHRHORN,  
Superintendent of Entomology.

## PUBLICATIONS FOR DISTRIBUTION.

The Board of Commissioners issues for general distribution to persons in the Territory, annual reports, bulletins, circulars, copies of its rules and regulations, and other occasional papers, which may be had, free, upon application.

A complete list of the publications of the Board available for distribution (together with the titles of certain issues now out of print) is to be found on the cover of the last biennial report.

Applications for publications should be addressed to the Mailing Clerk, P. O. Box 207, Honolulu, Hawaii.

## DIVISION OF HYDROGRAPHY.

Rooms 17-22 Kapiolani Bldg. Tel. No. 3662.

The Division of Hydrography has on hand free publications relative to the water resources of the Hawaiian Islands. These publications furnish detailed data as to daily, monthly, mean, maximum, and minimum run-off of streams and ditches, and also cuts and maps pertaining to the different islands. These publications will be mailed free of charge on request.

The records and maps of this Division are available for inspection by any one who desires information relative to water resources, topography, etc. Blue print copies of hydrographic data relative to any stream, ditch, spring, etc., which may be under observation by this Division will be mailed free of charge on request.

G. K. LARRISON,  
Superintendent of Hydrography.

# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XIV.

HONOLULU, FEBRUARY, 1917.

No. 2

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A quantity of Congressional vegetable seed has recently been received at the Government Nursery from Washington through our Delegate Hon. J. K. Kalanianaole. The seed is put up in two different ways. One package contains carrot, cucumber, lettuce, radish and turnip seed and the other contains pea, beet, lettuce, muskmelon and radish seed. These seeds will be distributed free as long as the supply lasts. Applications for them should be sent to the Forest Nurseryman, Box 207, Honolulu.

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Among the recent introductions of forest tree seed made by the Division of Forestry, are seeds of the acle, narra and Benguet pine which were obtained through the kindness of Mr. A. F. Fischer, Acting Director of Forestry at Manila, P. I. These species are important timber trees of the Philippines and show promise of being of value in these islands.

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The appointment, on January 1, of Mr. Will J. Cooper, as fruit and plant inspector for Maui, and of Captain George B. Leavitt on March 8 for Kauai, is another forward step taken by the Division of Entomology in the effort to keep injurious insect pests from entering our Territory.

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During January Entomologist D. T. Fullaway liberated 2205 parasites on the melon fly and 6511 parasites on the corn leaf hopper. These are both beneficial insects which have recently been introduced, the first coming from India and the second from the Philippines. Both already show promise of controlling the pests which have been bothering melon and corn growers. These parasites will be supplied for liberation, as fast as available, on application to the entomologist, Box 207, Honolulu.

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The agitation in Congress over the question of the eradication of bovine tuberculosis in states on the mainland, as pointed out in the January report of the territorial veterinarian, shows that the subject is now becoming of national importance. Hawaii is not far behind in the lead by having instituted years ago the campaign for the eradication of the disease which is dangerous to the public health.

Among the recent importations of live stock which should result in the improvement of the herds and flocks in the Territory may be noted 50 Merino rams from New Zealand, 15 Holstein cows and 2 Holstein bulls, 13 Southdown rams, and Duroc Jersey and Berkshire hogs.

## Division of Forestry

Honolulu, February 21, 1917.

Board of Commissioners of Agriculture and Forestry.

Gentlemen:—I respectfully submit the following routine report of the Division of Forestry for the month of January, 1917:

### FOREST RESERVE FENCING.

Two days during the month were spent at Hauula, Oahu, in conference with representatives of the homesteaders in that region who have agreed to build the fence, in accordance with the understanding, to keep their stock from getting into the forest, and in flagging the line on which the fence is to be constructed.

An inspection was made of the recently constructed short stretch of new fence on part of the boundary of the Lualualei forest reserve, Oahu, and it was found to be in good condition and the forest already showing the beneficial results of the protection.

Ranger F. B. Dodge, under instructions from this office, began during the month a detailed examination of the boundaries of government lands within the Hilo forest reserve, Hawaii, to ascertain where any new fencing is needed to keep stock out of the forest.

### FOREST PLANTING.

The planting of koa on the Manoa ranger station and on other parts of upper Manoa Valley within the reserve was continued and the experimental planting of representative quantities of exotic trees, mostly having timber value, was completed at this station.

A quantity of seed of the narra and acle, two important timber trees of the Philippines, was received from the acting director of forestry at Manila and has been germinated for planting out in suitable parts of the forest reserves.

### BIENNIAL REPORT.

A portion of my time has been spent in compiling statistics on tree planting and fencing in conjunction with the preparation of the report of this division for the past two years.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## REPORT OF FOREST NURSERYMAN.

Honolulu, February 21, 1917.

The Superintendent of Forestry.

Dear Sir:—The following is a report of the principal work done during the month of January, 1917.

*Nursery.*

## Distribution of Plants.

	In seed boxes	In boxes transplanted	Pot grown	Total
Sold . . . . .	...	100	34	134
Gratis . . . . .	...	400	578	978
	—	—	—	—
	...	500	612	1112

*Collections.*

Collections on account of plants sold amounted to.....	\$ 3.85
Rent of Office Building Nursery Grounds.....	35.00
Total.....	\$38.85

*Plantation Companies and Other Corporations.*

The distribution of trees under this heading amounted to 110,000 in seed boxes, 1650 in transplant boxes and 450 pot grown—total 112,100. All orders are now filled with the exception of a few which we have agreed to fill at intervals during 1917.

*Makiki Station.*

The work at this station has been principally routine. Owing to the great demand for trees during the past several months our stock has become very much reduced. We are now busy building up our stock again.

*Honolulu Watershed Planting.*

A piece of land above the planted forest on Kalawahine tract was planted with koa trees during the month, 706 being used. We are now clearing off and preparing for more planting in the lower end of Hering Valley.

*Advice and Assistance.*

The writer has at the request of people in and around the city made calls and given advice as follows:

Calls made .....	6
Advice given by telephone.....	8
Advice given by letter.....	5
Advice given people calling at nursery.....	12
 Total.....	 31

*Congressional Vegetable Seed.*

We have just received from Washington, D. C., through Honorable J. K. Kalanianaole, 2904 packages of vegetable seeds consisting of the following:

V-6 1542 packages containing in each, carrot, cucumber, lettuce, radish and turnips.

V-2 1362 packages containing in each, peas, beet, lettuce, muskmelon and radish.

Very respectfully,

DAVID HAUGHS,  
Forest Nurseryman.

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NICOTINE AS AN INSECTICIDE.

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(1) Nicotine spray solutions do not pass into the tracheæ, nor do they penetrate the integuments of insects.

(2) The fumes from nicotine used as a fumigant, the vapors from nicotine spray solutions, and the odoriferous particles from evaporated nicotine spray solutions or from powdered tobacco pass into the tracheæ and are widely distributed to all the tissues.

(3) Regardless of how it is applied, whenever nicotine kills insects, as well as all other animals, it kills by paralysis, which in insects travels along the ventral nerve cord from the abdomen to the brain.

(4) The writer does not know just how nicotine paralyzes the nervous system, but he does know that it prevents the nerve cells from functioning, and that in regard to the simplest animals its presence around the cells causes the same structural changes resulting in death as observed when other animals of the same kind are deprived of oxygen. In such cases it seems to kill physically rather than chemically, but the evidence presented does not conclusively prove this view.—Exchange.

## Division of Plant Inspection

Honolulu, January 31, 1917.

Board of Commissioners of Agriculture and Forestry.

Gentlemen:—I respectfully submit my report of the work done by the Division of Plant Inspection for the month of January, 1917, as follows:

During the month there arrived at the port of Honolulu 55 vessels of which 23 carried vegetable matter. Of these vessels 11 passed by the way of the Panama Canal in transit to the Orient.

<i>Disposal</i>	<i>Lots</i>	<i>Parcels</i>
Passed as free from pests.....	1,254	26,768
Fumigated .....	2	2
Burned .....	115	115
Returned as contraband.....	7	7
 Total.....	 1,378	 26,892

Of these shipments 26,537 packages arrived as freight, 238 packages as baggage of passengers and immigrants and 117 packages as mail matter.

### *Rice and Bean Shipments.*

During the month 27,069 bags of rice and 1451 bags of beans from Japan and other Oriental ports arrived and after careful inspection were passed as free from pests.

### *Pests Intercepted.*

Approximately 3435 pieces of baggage belonging to passengers and immigrants from foreign countries were examined and 75 packages of fruit and 14 packages of vegetables were seized and destroyed by burning.

On January 1 three ornamental plants were ordered back on board having no federal permit. These were being brought by one of the crew for friends. On the same date a passenger brought a package of walnuts from Korea, and as these were found infested with the larvae of a moth, they were destroyed. On January 6 a miniature garden containing a 5-leaf pinetree, prohibited by the federal horticultural board, a cherry tree infested with a brown velvet lichen and other plants was destroyed by burning. On January 9 a box of grapefruit from the Isle of Pines, West Indies, via San Francisco, by Wells Fargo & Co.'s express was seized and destroyed, it being a prohibited importation. Two packages of tree seeds, one from Manila and

one from Australia for the forester, were fumigated with carbon-bisulphide as a precaution.

The following fruit, seeds and bulbs were seized in the post office and treated and returned to the shipper:

One package of chestnuts from Japan, 1 package of citrus from Japan, 1 package of bulbs from Portugal, 1 package of tree-seeds from Japan, one package of merchandise from Japan containing a few sandpears, and these were removed and destroyed before the package was delivered. Another package of merchandise contained some bulbs which were seized and destroyed. Five packages of beneficial insects for the H. S. P. A. arrived during the month; four of these arrived in bad condition and were destroyed by burning. All soil accompanying the other shipment was disinfected and burned.

#### *Hilo Inspection.*

Brother M. Newell of Hilo reports the arrival of seven steamers and three sailing vessels. Four steamers brought vegetable matter consisting of 193 1ots and 3293 packages of fruits and vegetables which were all found free from pest. The three sailing vessels brought lumber.

#### *Kahului Inspection.*

On January 1 Mr. Will Cooper of Wailuku, Maui, was installed as fruit inspector. On January 11 I accompanied the steamer Lurline to Kahului for the purpose of being present at the inspection of the fruit and vegetable shipments. Mr. Cooper met me at the wharf and we went over the various shipments together. The importers were very pleased that all shipments are to receive a local inspection and will coöperate with Mr. Cooper in every way. Mr. Cooper reports the arrival of two vessels during the month, bringing 14 lots and 537 packages of fruits and vegetables, all of which were found free from pests and were passed for delivery.

#### *Inter-Island Inspection.*

Seventy-one steamers plying between the port of Honolulu and other island ports were attended to during the month. The following shipments were passed as free from pests:

Taro, 646 bags; plants, 137 packages; vegetables, 159 packages; fruit, 16 packages; total passed, 958 packages.

The following packages were refused shipment as they did not meet with the regulations pertaining to soil and infestations:

Plants, 16 packages; fruit, 4 packages; total refused, 20 packages.

Respectfully submitted,

E. M. EHRHORN,  
Chief of Division of Plant Inspection.

## Division of Entomology

Honolulu, February 28, 1917.

Board of Commissioners of Agriculture and Forestry.

Gentlemen:—During the month of January the insectary produced 1442 females and 1138 males of the *Opium fletcheri*, and the distribution of parasites was as follows:

### *Opium fletcheri.*

	Females	Males
Moilili . . . . .	280	210
Moanalua . . . . .	310	260
Niu . . . . .	100	50
Kailua—Windward Oahu . . . . .	585	410

### *Tetrastichus.*

Nuuau . . . . .	400
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### *Galesus Silvestrii.*

Nuuau . . . . .	63
The corn leaf hopper egg parasites were distributed as follows:	
Waikiki . . . . .	25
H. S. P. A. . . . .	30
U. S. Experiment Station . . . . .	444
Sheridan Street . . . . .	900
Moilili . . . . .	2116
Board of Agriculture and Forestry . . . . .	300
Makiki . . . . .	500
College of Hawaii . . . . .	300
Kailua—Windward Oahu . . . . .	1761
C. Gay (Lanai) . . . . .	135

We now have definite proof of the establishment of the melon fly parasite in Kona on the Island of Hawaii, parasites having been bred from infested wild morordicas brought in by Mr. Pemberton. The parasite has also been recovered several times in Honolulu from infested cucurbitaceous fruits.

Very respectfully,

D. T. FULLAWAY,  
Entomologist.

## Division of Animal Industry

Honolulu, February 23, 1917.

Board of Commissioners of Agriculture and Forestry.

Gentlemen:—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of January, 1917.

### *Bovine Tuberculosis Work.*

With the approaching session of the territorial legislature and possible action with regard to the work of this Division along the lines of control and eradication of bovine tuberculosis, it seems almost providential that the subject should have been considered by the federal congress at its present session.

In accordance with a correspondent to the Breeder's Gazette, Representative Linthicum of Maryland recently advocated before the House of Representatives the destruction of all cattle having tuberculosis, the payment for them at determined rates, the pasteurization of all dairy products, and the compulsory tuberculin test of all dairy cattle. It is estimated that 10 per cent, or 2,000,000, of the dairy cattle of the country are tubercular while slaughterhouse records show  $2\frac{1}{2}$  per cent of the beef cattle and 9 per cent of the hogs to be similarly infected. Mr. Linthicum would further compel the sanitary handling, storing and marketing of meat and dairy products. The feasibility of the project has been demonstrated in the District of Columbia and the urgency of the situation is recognized by the Department of Agriculture as evidenced by its request of Congress for an appropriation of \$75,000 for testing pure bred cattle in co-operation with the owners.

The same correspondent goes on to say that the National Grange at its meeting in Washington last November urged breeders and handlers of all classes of dairy cattle to weed out the reactors to the tuberculin test as a matter of protection to their own financial interests. The Grange believes that reasonable compensation should be allowed for all animals killed in the eradication of tuberculosis.

The above quotations show plainly that the eradication of bovine tuberculosis is fast becoming a question of national importance, and credit will undoubtedly redound upon the states, counties and communities which have taken the lead and evolved the methods upon which nation-wide efforts must necessarily be based. By the same token the relinquishment of years of effort and expense at this time might easily assume an aspect very undesirable and difficult to explain.

*Dog Distemper at Quarantine Station.*

The cold and wet weather during January was partly responsible for the loss of three pups and two dogs while in quarantine, though the direct cause was the introduction of the infection with unvaccinated pups. These losses while regrettable are, however, insignificant when compared with what might have happened had we not had the use of distemper bacterin and serum at hand. These new remedies, while far from infallible, have undoubtedly served to protect or cure the more than twenty other dogs present when the disease was introduced. The point, however, which it is wished to bring out is the danger always attendant upon bringing your dogs or puppies to a strange climate, on an ocean voyage of at least six days, during the middle of the winter, and without taking the precaution of protective vaccination before starting the animal away from its home. Prospective dog importers are therefore urged to have a veterinarian vaccinate their dogs before taking or sending them on board the steamer for Honolulu. The treatment consists in two or three hypodermic injections at intervals of one or two days, the cost of the vaccine (three small bottles) being \$1.50, to which should be added the veterinarian's fee. This treatment will in most cases protect the animals against a fatal attack of the disease. If neglected the treatment of the sick dogs is far more difficult and complicated and the mortality among unvaccinated dogs frequently reaches 75 to 90 per cent. Dog distemper is a highly infectious and very easily transmitted disease which once it gains entrance to a kennel or quarantine station is likely to attack all the susceptible animals, that is, those which have not had the disease before or been vaccinated. And even then it is advisable to avoid shipping pups or bitches in whelp during December, January and February.

*Importation of Live Stock.*

The past month saw the arrival of more live stock than usual and of not less than 8 dogs and 14 cats. Of most interest were the fifty Merino rams which the Parker Ranch receives annually from New Zealand. Unfortunately two of these were injured, one so badly it had to be killed and one with a broken front leg which very likely will recover.

A fine shipment of Holstein cows (15) and bulls (2) arrived for Mr. Robert Hind, while Mr. A. Robinson received 13 pure-bred Southdown rams and 2 Kentucky jennets. Some very good hogs, Duroc Jerseys and Berkshires also will help improving the live stock of the Territory.

Respectfully submitted,

VICTOR A. NORGAARD,  
Territorial Veterinarian.

## REPORT OF ASSISTANT VETERINARIAN.

Honolulu February 19, 1917.

Dr. Victor A. Nörgaard, Chief of Division of Animal Industry.

Sir:—I have the honor to submit the following report for the month of January, 1917:

*Tuberculosis Control.*

The following dairy cattle were tested during the past month:

	T.	P.	C.
M. Reidell .....	1	1	0
Miss L. Macfarlane.....	1	0	1
E. A. Scott.....	2	2	0

A total of four cows were tested out of which number three were passed and tagged and one condemned and branded.

*Importation of Live Stock.*

S. S. Tenyo Maru, Orient—2 dogs, Geo. A. Fahys.

S. S. Lurline, San Francisco—50 Merino rams (New Zealand), A. W. Carter; 1 horse, M. H. Gould; 1 horse, Capt. V. D. Dixon; 1 Shropshire ram, L. C. Clark; 1 dog, J. F. C. Hagens; 15 Holstein cows, 2 Holstein bulls, Hind, Rolph &amp; Co.; 11 crates poultry, various; 13 Southdown rams, 2 Jennets, A. Robinson; 1 Shorthorn bull, A. Robinson. Kahului—1 Berkshire hog, L. K. Smith; 1 Holstein cow, W. A. McKay.

S. S. Manoa, San Francisco—51 crates poultry, various. Kahului—1 crate poultry, 2 crates turkeys, Wm. Pogue.

S. S. Hilonian, San Francisco—4 Duroc Jersey hogs, C. D. Pringle.

S. S. Makura, Vancouver—1 dog, W. S. Stanley.

S. S. Matsonia, San Francisco—1 dog, N. S. Castle.

S. S. Great Northern, San Francisco—3 dogs, 14 cats, Mrs. J. C. Cameron.

Respectfully submitted,

LEONARD N. CASE,  
Assistant Territorial Veterinarian.

Among the things recently demonstrated by the federal forest products laboratory at Madison, Wis., is that a much stronger box than the type ordinarily used can be made with less material by increasing the number of nails and by properly proportioning the thickness of the sides and ends. A loss that reaches many millions of dollars annually is, it is stated, caused by damage to goods in transit, largely because of faulty containers.

## Division of Hydrography

Honolulu, February 13, 1917.

Board of Commissioners of Agriculture and Forestry.

Gentlemen:—The following report of operations of the Division of Hydrography during January, 1917, is submitted:

### KAUAI.

The regular monthly visit to the mauka measurement stations revealed the fact that the December 18 flood, which destroyed the Hanapepe river measurement station, also destroyed the measurement station recently established on the Waiahu'u branch of the Waimea river, including the new Gurley recording instrument.

Several staff gages were destroyed and, at most of the mauka stations, much damage was done to the measurement sections in the channels, these being filled with huge boulders and debris. An estimate of the cost of repairing and replacing stations is now being prepared and will be submitted as soon as possible.

The U. S. Weather Bureau maximum and minimum thermometers, recently established at Kokee, elevation 3,550 feet (in the area suggested as a territorial camping place), showed a minimum for January of 32° F. These instruments are established, sheltered and operated in exact accordance with U. S. Weather Bureau regulations. The minimum reading for December was about 41° F.

Twenty-nine stream and ditch measurement stations and 12 rainfall measurement stations were visited, and 17 discharge measurements were made. Three stream measurement stations were discontinued (destroyed by December flood).

### OAHU.

To prevent the artesian well head measurement work being suspended during the balance of the fiscal year ending June 30, 1917, this division has undertaken to keep up this work in connection with the surface hydrometric work until some provision can be made by the 1917 Legislature of the Territory of Hawaii relative to the future status of underground water investigations.

Data obtained to date from the Hillebrand Glen run-off investigation show the following interesting facts. The total period covered is from May 23, 1916, to January 31, 1917:

- Average daily flow, 530,000 gallons.
- Average percentage of run-off to rainfall, 22½%.
- Maximum percentage of run-off to rainfall, (January) 35%.

A detailed report relative to this work will be submitted in the near future.

Twenty-two stream measurement stations and 6 rainfall measurement stations were visited, and 12 discharge measurements were made.

MAUI.

R. C. Rice spent 12 days and H. A. R. Austin 15 days on Maui. All stream and rainfall measurement stations were visited and put in good order. Seven float wells were pumped out and all foreign material removed. Twenty discharge measurements were made.

Very respectfully,

G. K. LARRISON,  
Superintendent of Hydrography.

BOARD APPOINTMENTS.

During the calendar year 1916, appointments to the following positions were made by the Board of Agriculture and Forestry, and commissions issued to the following persons:

- January 6, Dr. H. L. Lyon, Honorary Plant Pathologist.
- May 16, Joseph F. Rock, Special Agent.
- June 21, Marion Cabral, District Fire Warden, Maui.
- June 21, John Fassoth, District Forester and Fire Warden, Maui.
- June 21, A. A. Wilson, District Fire Warden, Oahu.
- June 21, Eric A. Knudsen, District Forester and Fire Warden, Kauai.
- June 21, Marston Campbell, Jr., Laboratory Assistant.
- June 21, Dr. A. R. Rowat, Dep. Terr. Vet., West Hawaii.
- July 15, Francis B. Dodge, Forest Ranger for Hawaii.
- November 28, F. S. Lyman, Jr., District Fire Warden, Oahu.
- November 28, James Lindsay, Forest Ranger, Maui.

According to an article in the India Rubber World quoted by the Agricultural News, W. I., there is some prospect that the United States may become a rubber-producing country if an active attempt is made to cultivate on an extensive scale the silver-colored Guayule shrub, *Parthenium argentatum*, a member of the aster family which grows wild in many sections of the American south-west, as it does over the central plateau of Mexico. On the basis that the plant yields 8 per cent of its dry weight in rubber, which is a conservative estimate, an acre would yield 4000 lb. worth \$1520, according to the present low market price of 38c. per lb. There is no doubt that, if the project is practicable, the United States would greatly strengthen its economic position if it could establish rubber within its own territory.

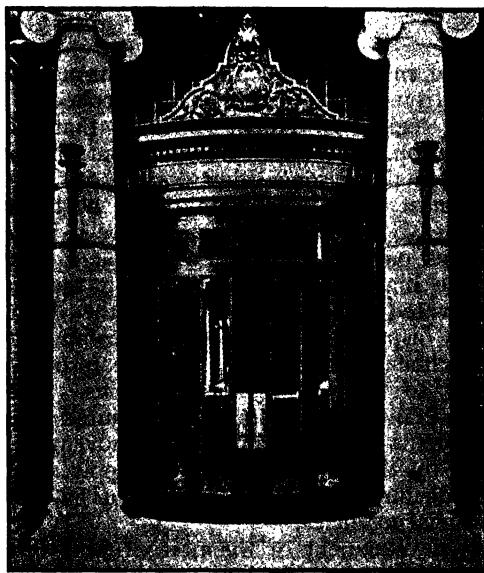
## SPREAD OF COTTON BOLL WEEVIL.

A brief history of the movement of this pest through the United States suggests, from a study of specimens collected in all parts of the infested regions of North America, that there are three lines of dispersion. It seems probable that the boll weevil originated in Guatemala or some other portion of Central America, and that the most typical strain migrated northward through the mountains of Mexico into Arizona, where it is now found as a native species on the wild cotton-like plant *Thurberia thespesioides*. The main migration was along the Gulf Coast through the cultivated cotton regions into the United States. The third line of dispersion was through Yucatan across the Gulf, to Cuba. Specimens collected at the three termini of these dispersions appear to be very distinct varieties. That variety which is found on cultivated cotton in the United States is the smallest found and the most variable. The movement of the weevil is controlled by the amount of food supply, which regulates the time and distance of natural movement by winds and floods, and by artificial agencies.

The most interesting development of the present year is the extension of the weevil to the northern limits of cotton growth in Oklahoma and Arkansas into Central Tennessee; eastward to the Atlantic Ocean south of Savannah; and the infestation of practically all the cotton region of Florida. The only Sea Island cotton section now not infested is that of South Carolina.—*Science.*

Experiments made in the state of San Paulo, Brazil, by a railway company, showed that five varieties of eucalyptus possessed high fuel value. *E. rostrata* and *E. tereticornis* are represented, in a bulletin of the International Institute of Agriculture, as being "equal or superior to the best hard woods; they burn with a short flame and last a long time." *E. robusta* is mentioned among three varieties that also yield woods which are hard, though a little less so than the two just previously described.

Sisal fiber in British East Africa is stated, in the annual report of the department of agriculture of that protectorate, to have an output of 50 tons a week, which is realizing £28 to £38 (\$140 to \$190) a ton in the London market.



## The Bank of Hawaii Limited.

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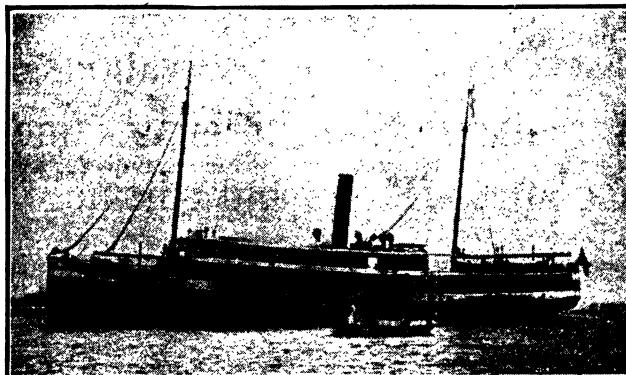
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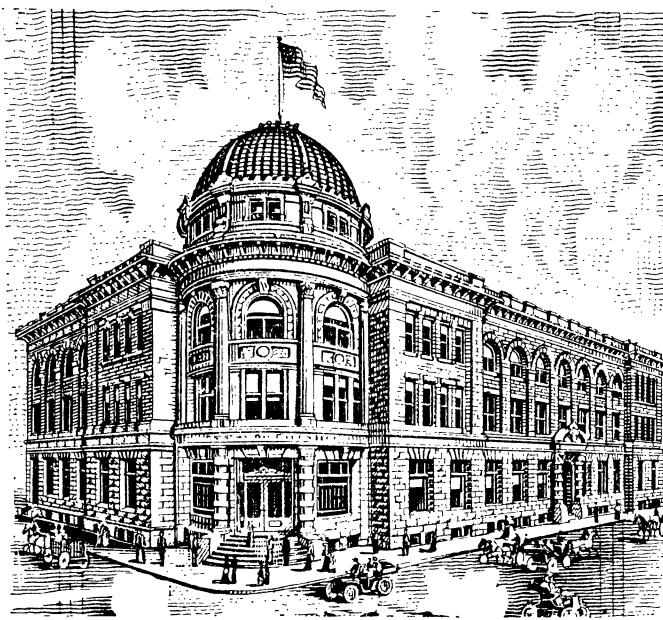
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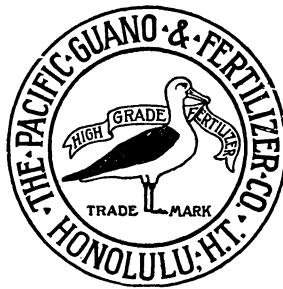
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